

No. 864,444.

PATENTED AUG. 27, 1907.

J. W. BOILEAU.
GRINDING MILL AND PULVERIZER.

APPLICATION FILED SEPT. 7, 1906.

3 SHEETS—SHEET 1.

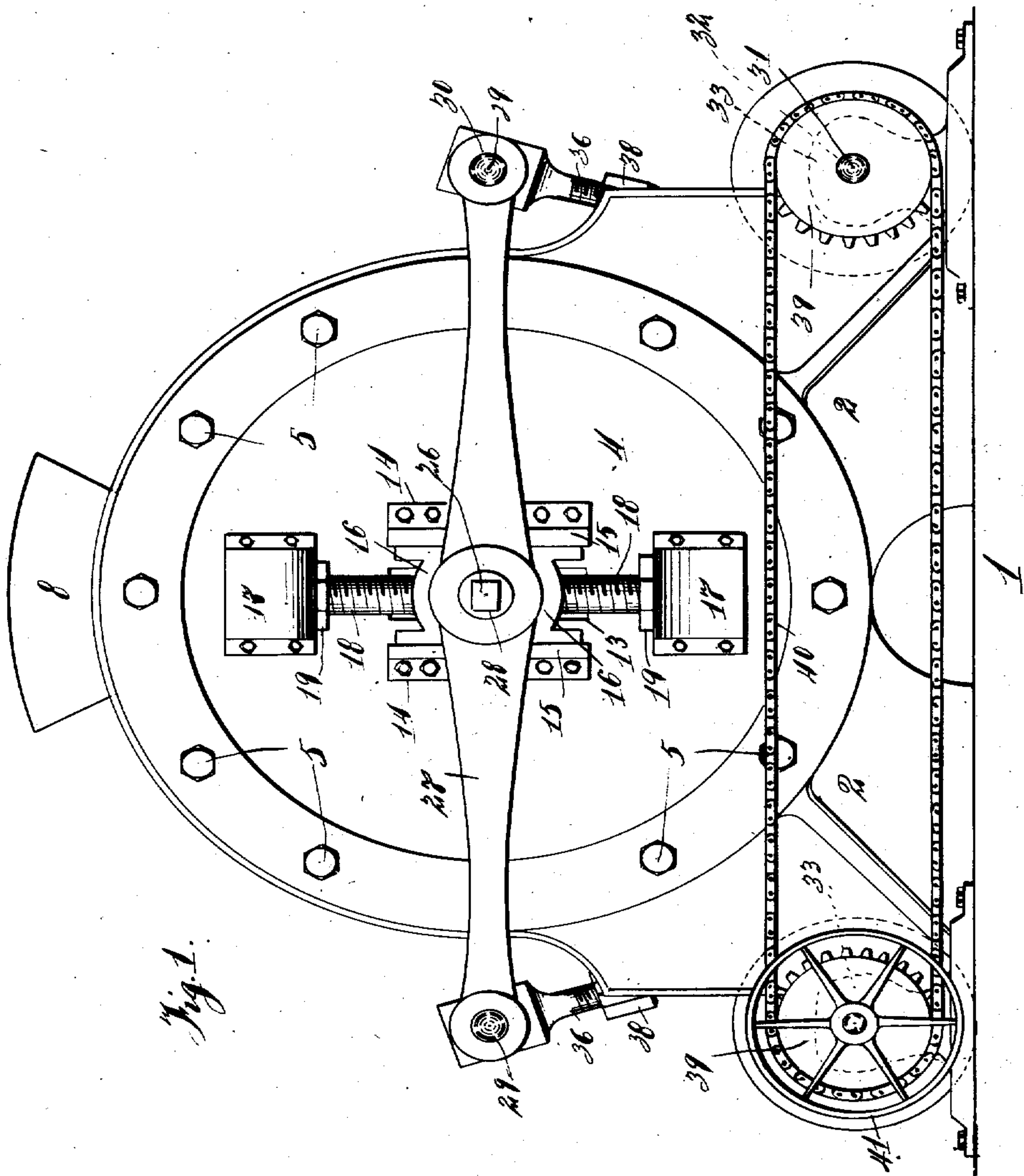


Fig. 1.

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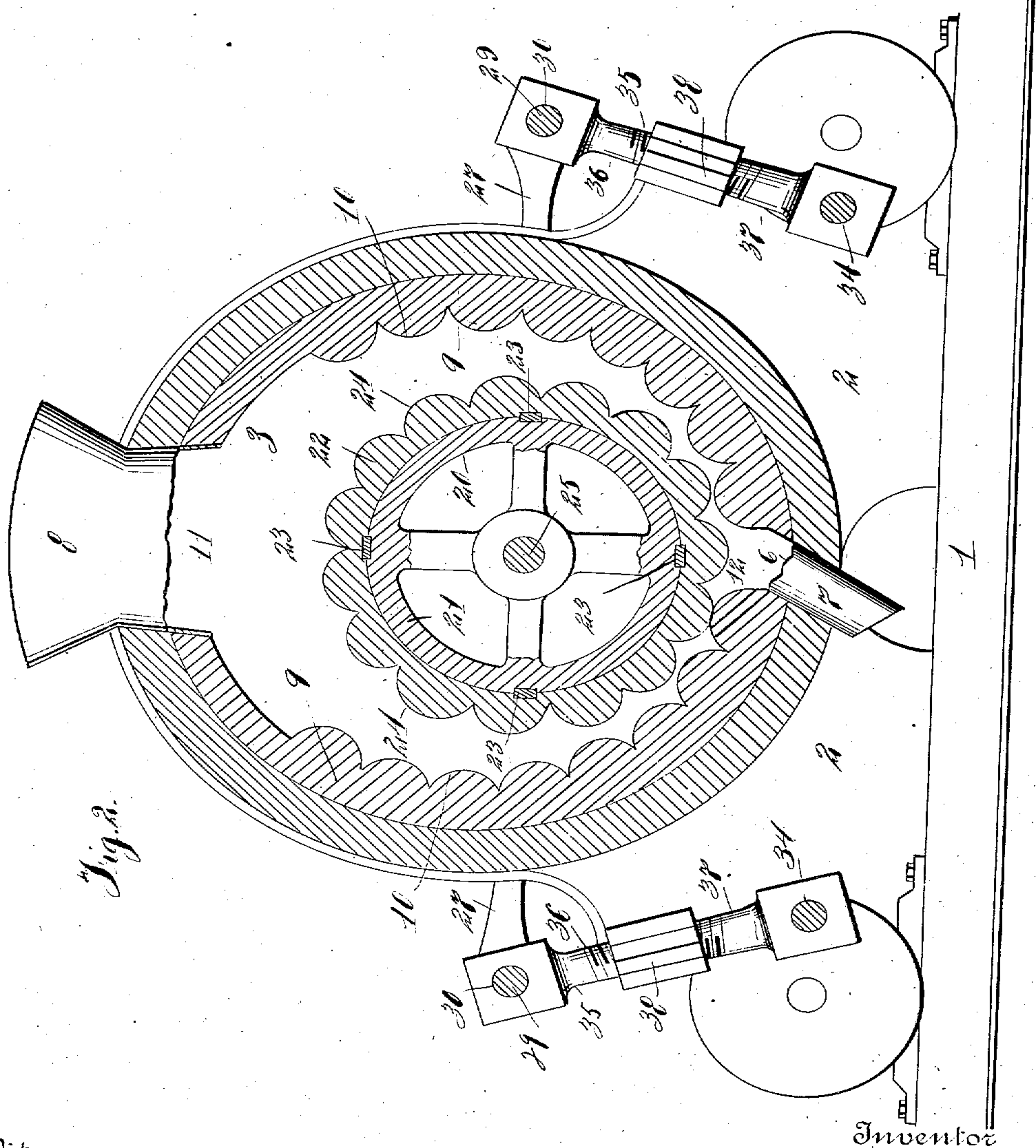
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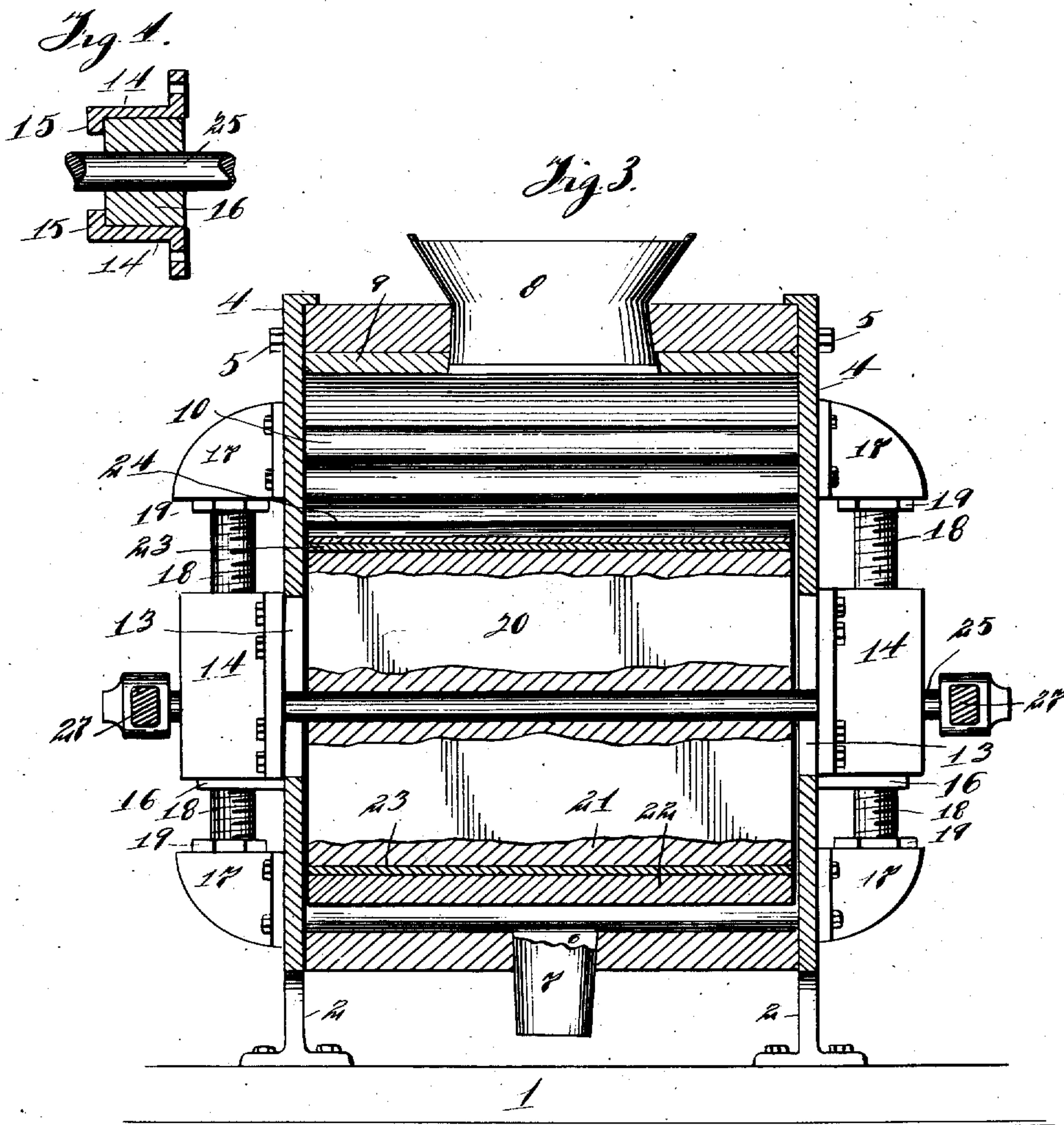
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UNITED STATES PATENT OFFICE.

JAMES W. BOILEAU, OF DETROIT, MICHIGAN.

GRINDING-MILL AND PULVERIZER.

No. 864,444.

Specification of Letters Patent.

Patented Aug. 27, 1907.

Application filed September 7, 1906. Serial No. 333,706.

To all whom it may concern:

Be it known that I, JAMES W. BOILEAU, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Grinding-Mills and Pulverizers; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention is an improved grinding mill and pulverizer, especially adapted for grinding or pulverizing mineral bearing rock, but also adapted for grinding or pulverizing other materials and substances, and it consists in the construction, combination, and arrangement of devices hereinafter described and claimed.

In the accompanying drawings,—Figure 1 is a side elevation of a mill embodying my invention; Fig. 2 is a vertical longitudinal sectional view of the same; Fig. 3 is a vertical transverse sectional view of the same; Fig. 4 is a detail horizontal sectional view, showing the construction of one of the bearings and of the guides therefor of the adjustable roller.

On a bed-plate 1 is secured a casing 2, which is provided with a horizontal, transversely-extending cylindrical chamber 3, the said chamber having heads 4 secured by bolts 5. In the lower side of the cylindrical chamber is a discharge opening 6 having a discharge spout or pipe 7. On the upper side of the said cylindrical chamber is a feed hopper 8. On the inner side of the cylindrical chamber is a fixed cylindrical grinding element 9, which is here shown as a chilled, cast-iron cylinder provided on its inner side with convex ribs 10, which extend longitudinally thereof. Said cylinder 9 has a feed opening 11 at its upper side, and a discharge opening 12 at its lower side. The heads 5 are provided with vertical central openings 13, and on the outer sides of said heads are vertical guides 14, which are here shown as cleats bolted in place and formed with inwardly-extending guide flanges 15, which engage adjustable bearing blocks 16, the said bearing blocks being slidable between the said guide flanges and the outer faces of the heads 5. On the outer sides of the heads 5, above and below the openings 13, are brackets 17, which are here shown as bolted in place. They may be otherwise constructed and secured within the scope of my invention. The said brackets 17 are provided with guide sockets for the reception of the outer ends of adjusting screws 18, the inner ends of which are stepped in the upper and lower sides of the bearing blocks 16. On the said adjusting screws are adjustable nuts 19, which engage the brackets 17 and may be turned on the screws 18 to cause the latter to raise or lower the bearing blocks 16, as may be desired.

An oscillating grinding roll 20 is disposed within the grinding cylinder, and is here shown as comprising an inner wheel member 21 and an outer cylindrical mem-

ber 22, secured thereon by keys 23 and provided with peripheral grinding ribs 24, which extend longitudinally thereof and coact with the grinding ribs of the cylinder 9 to crush and reduce material between them. The wheel 20 is mounted on and keyed or otherwise secured to a shaft 25, which extends through and is vertically adjustable in the openings 13, has its bearings in the adjustable bearing blocks 16, and has its outer ends squared, as at 26. Walking beams 27 have squared openings 28 at their centers to receive the squared polygonal ends of the oscillating grinding roll shaft. The said oscillating grinding roll is disposed eccentrically in the fixed grinding cylinder with its lower side in contact, or nearly so, with the lower side of the fixed grinding cylinder, and it will be understood that by means of the walking beams the oscillating grinding cylinder may be operated. Owing to the polygonal form of the ends of the oscillating roll shaft and of the openings in the walking beams, the latter may be shifted on the roll shaft to bring a new surface of the oscillating roll into operative relation to the lower surface of the fixed inner grinding cylinder 9, and hence when one portion of the surface of the oscillating grinding roll becomes worn from use, another portion of the surface thereof may be brought into requisition so as to prolong the life of the said oscillating grinding roll.

Within the scope of my invention, any suitable means may be employed for working the walking beams and causing the latter to operate the oscillating grinding roll. For the purposes of this specification I have here shown suitable means for operating said walking beams, which means I will now describe: The ends of the walking beams are connected by shafts 29 which have their bearings, as at 30, in the ends of said walking beams. Shafts 31 have their bearings, as at 32, in standards 33, which are here shown as bolted at the ends of the bed-plate. Each of said shafts is provided with a crank 34. Pitmen 35 connect the said cranks to the centers of the shafts 29. Each pitman 35 is longitudinally adjustable so that it may be lengthened or shortened as may be required to compensate for the vertical adjustment of the oscillating inner grinding roll. Each pitman to enable it to be longitudinally adjusted is composed of sections 34, 35, provided with reversely-threaded screw portions 36, 37, connected together by tubular sleeve nuts 38, threaded to receive said screw portions 36, 37. On each of the shafts 31 is secured a sprocket wheel 39. Said sprocket wheels are connected together by an endless sprocket chain 40, which causes said shafts to rotate in unison. One of the said shafts 31 is also provided with a drive wheel 41.

From the foregoing description, taken in connection with the accompanying drawings, the construction and operation of the invention will be readily understood without requiring a more extended explanation.

Various changes in the form, proportion, and the

minor details of construction may be resorted to without departing from the principle, or sacrificing any of the advantages of this invention, as defined by the appended claims.

5 Having thus described my invention, what I claim as new, and desire to secure by Letters-Patent, is,—

1. In a mill of the class described, the combination of a casing having a cylindrical grinding chamber, an oscillating cylindrical grinding roll, mounted eccentrically in
10 said grinding chamber, vertically adjustable bearings for the shaft of said roll, means to adjust said bearings and hence adjust the roll toward or from the opposing surface of the grinding chamber, a walking beam attached to the shaft of the roll, crank shafts, fixed bearings therefor, and
15 longitudinally adjustable pitmen connecting the cranks of said shafts and the said walking beam, substantially as described.

2. In a mill of the class described, the combination of a casing having a cylindrical grinding chamber and vertical
20 guides at opposite sides of said chamber, an oscillating

cylindrical grinding roll mounted eccentrically in said grinding chamber and having an axle shaft, vertically adjustable bearings for the said shaft, mounted in the guides of the casing, means to adjust said bearings and hence also said grinding roll, a walking beam attached to the
25 shaft of the roll, crank shafts, fixed bearings therefor, and longitudinally adjustable pitmen connecting the cranks of said shafts and the said walking beam, substantially as described.

3. A mill of the class described having a cylindrical
30 grinding chamber provided with an annular interior grinding face, an oscillating grinding roll mounted eccentrically in said grinding chamber and having a peripheral grinding face coacting with that of the cylindrical grinding chamber, a shaft for said roll, and bearings for said
35 shaft, said roll being angularly adjustable in said bearings.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JAMES W. BOILEAU.

Witnesses:

JOSEPH T. BELANGER,
HARVEY F. BELANGER.

Correction in Letters Patent No. 864,444.

It is hereby certified that Letters Patent No. 864,444, granted August 27, 1907, upon the application of James W. Boileau, of Detroit, Michigan, for an improvement in "Grinding-Mills and Pulverizers," were erroneously issued to "said James W. Boileau" as owner of the entire interest, whereas said Letters Patent should have been issued to the inventor, *James W. Boileau, and Joseph T. Belanger, John L. Cochrane, and Eugene O. Spaulding, jointly*; said Belanger, Cochrane, and Spaulding being assignees of one-sixth interest each in said invention, as shown by the record of assignments in this office; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 19th day of November, A. D., 1907.

[SEAL.]

E. B. MOORE,
Commissioner of Patents.

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